

# UK Patent Application

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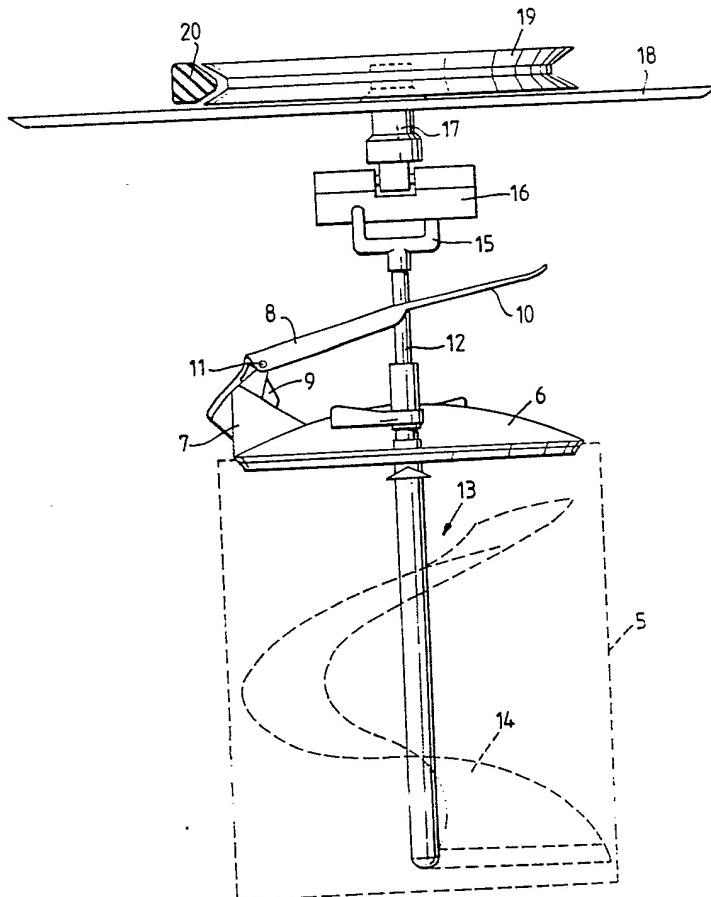
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(58) Field of search  
B1C  
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## (54) Stirring apparatus for paint

(57) Liquid stirring apparatus includes a plurality of shelves each having a plurality of containers 5 for the liquid to be stirred, each shelf having associated therewith a plurality of stirring devices 13 each having a stirring element 14 to stir the liquid in an associated container. Each shelf also has drive means for operating the stirring elements associated therewith, each drive means being selectively engageable with a main drive.

FIG.2.



The drawing(s) originally filed was (were) informal and the print here reproduced is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1982.

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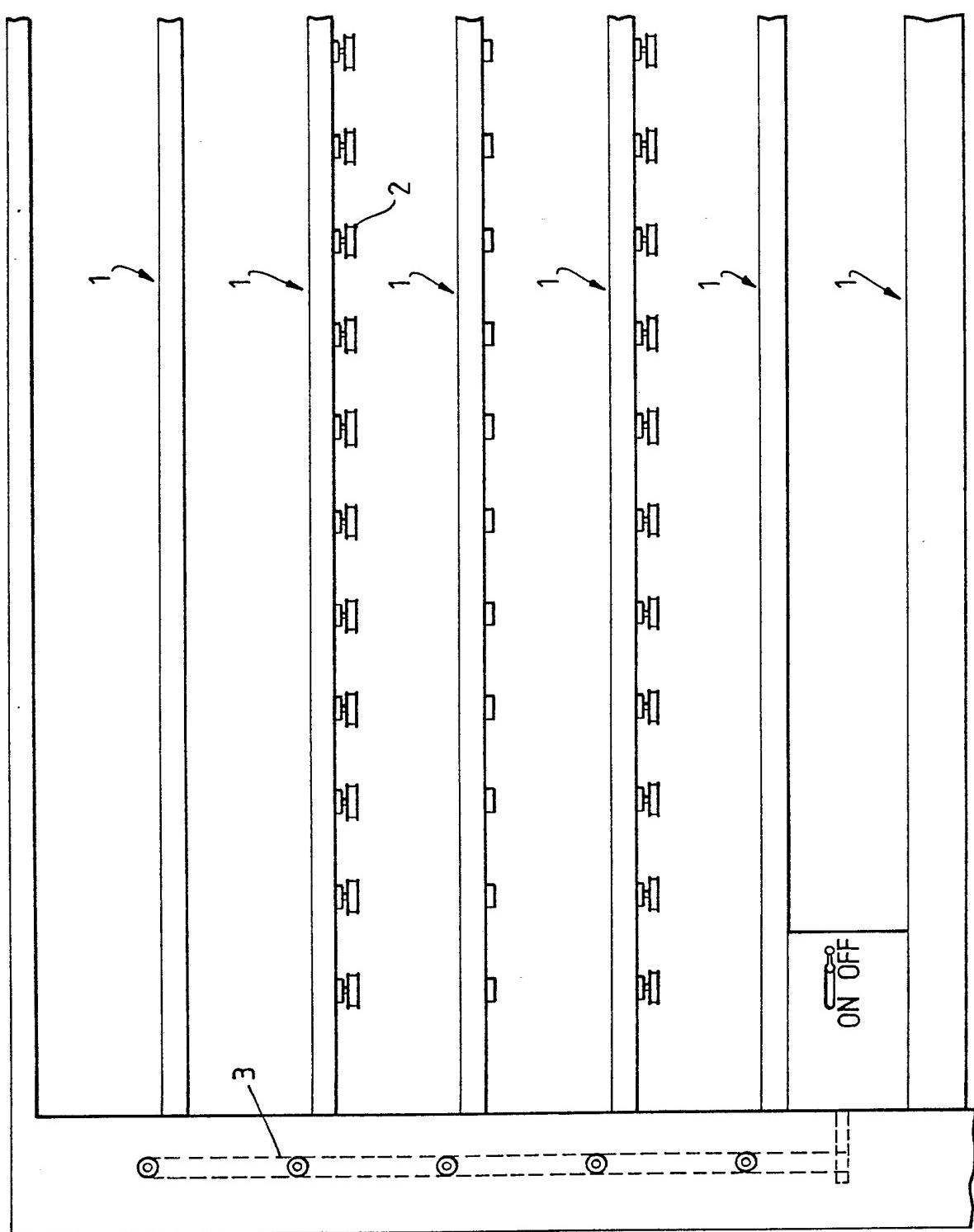
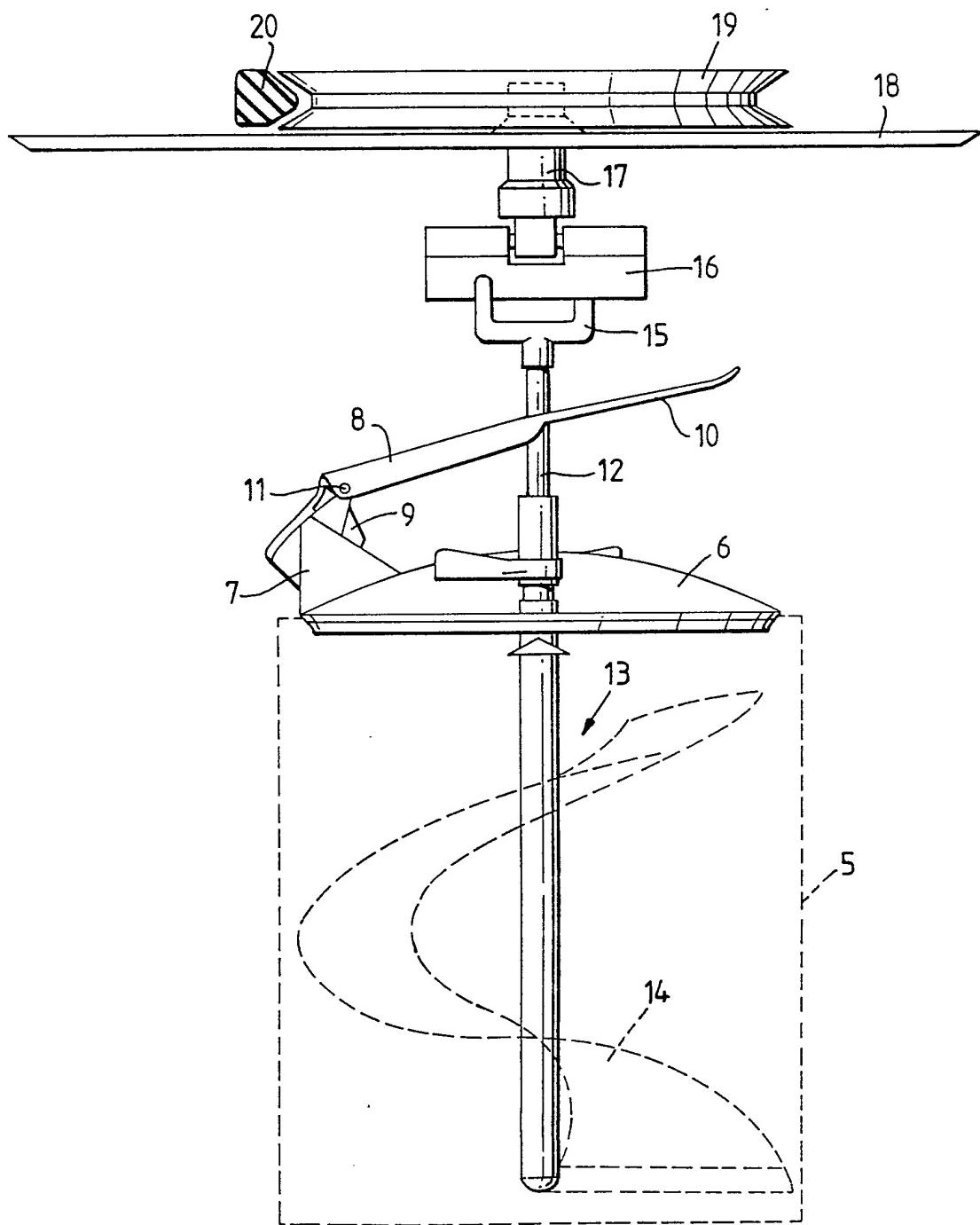


FIG. 1.

FIG. 2.



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FIG. 3a.

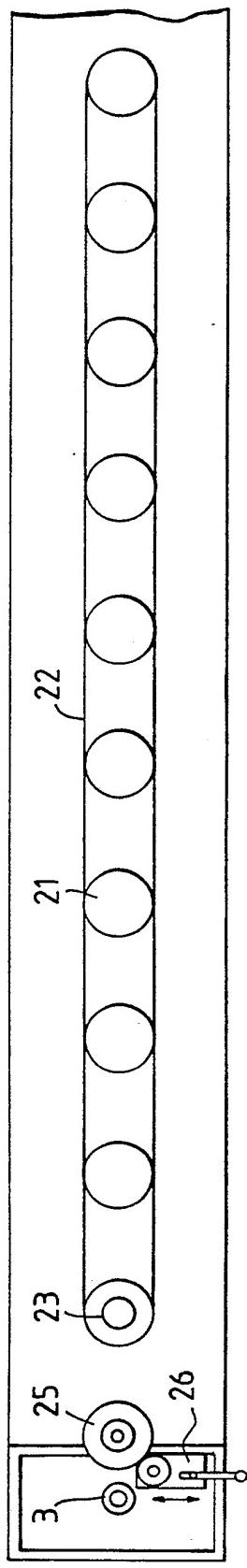


FIG. 3b.

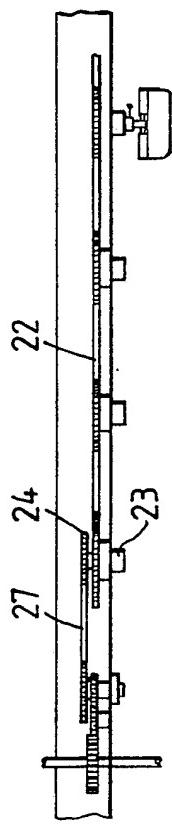
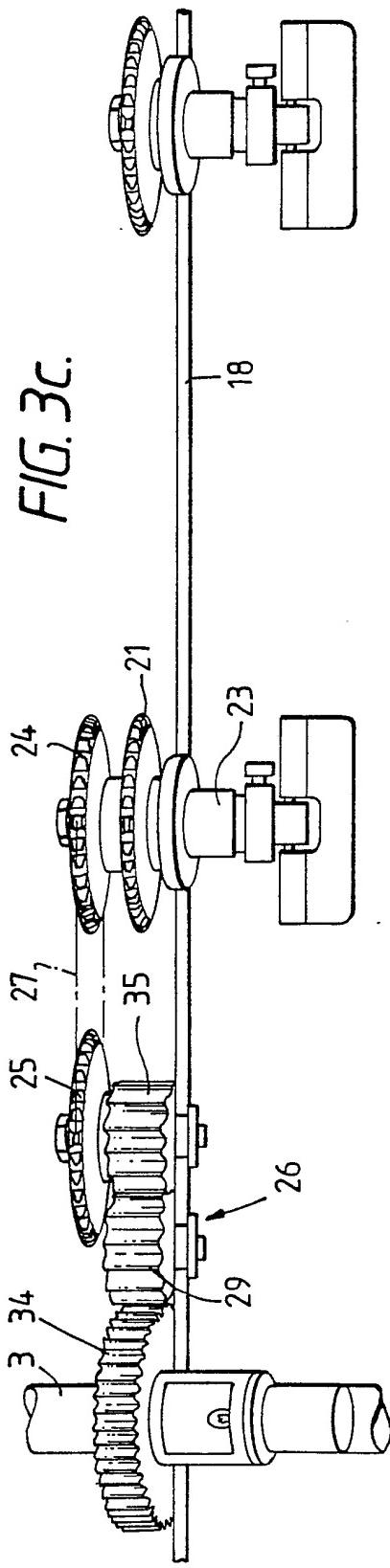


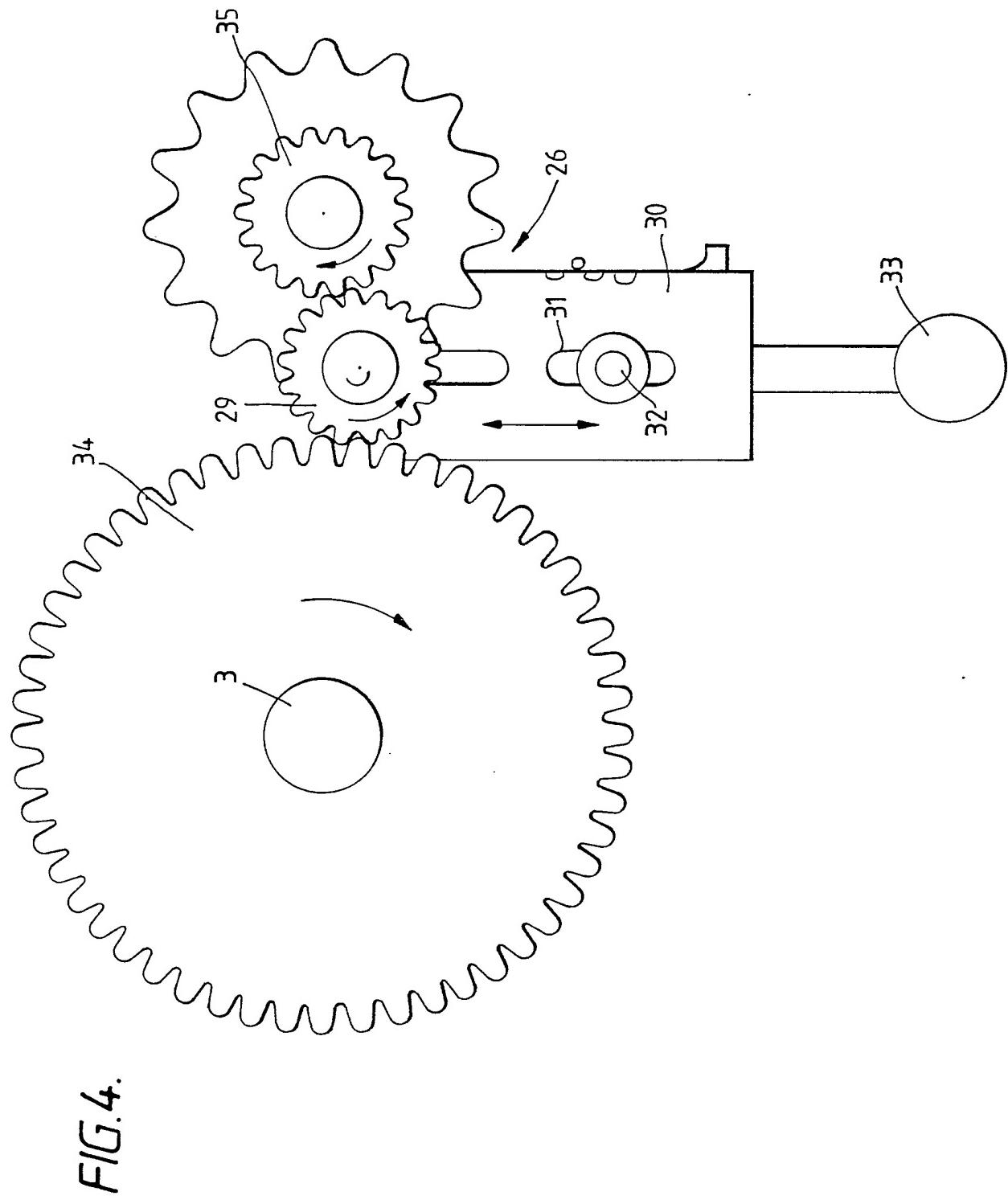
FIG. 3c.



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Fig. 4

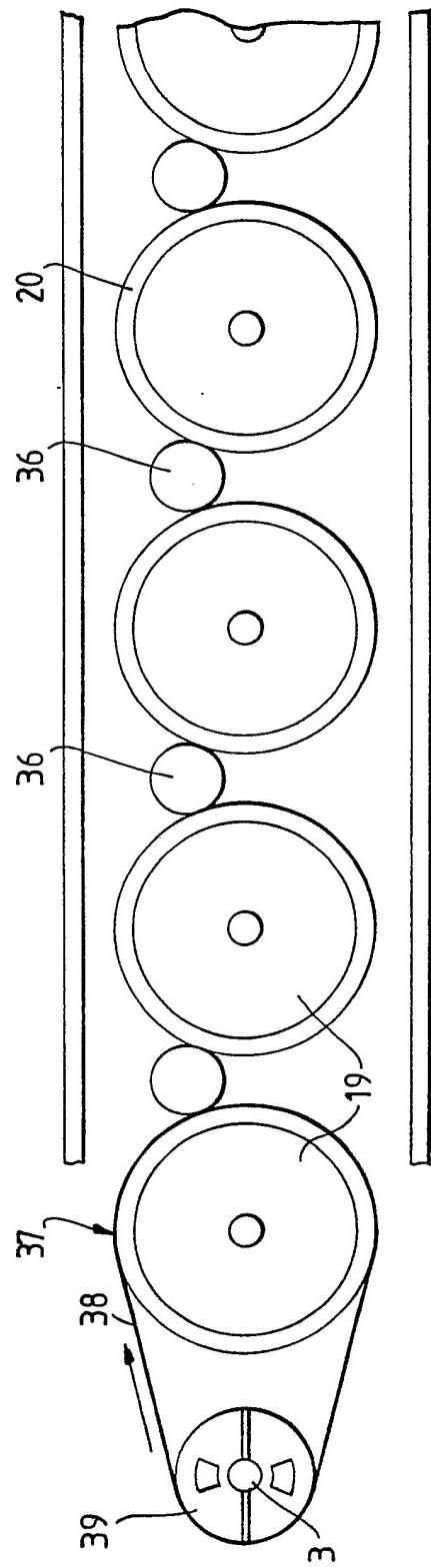
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FIG. 5.



Liquid Stirring Apparatus

This invention relates to liquid stirring apparatus and, particularly, but not exclusively, to apparatus for stirring tins of paint to ensure that the paint is in an homogeneous form.

In many parts of industry, manufactured components may be finished in a variety of colours so that during a days production, it may be necessary to use paint from a large of containers, often selected at short notice. It is therefore essential that the paint be kept in a form in which it is immediately usable. As many types of modern paint have a tendency to separate out into separate ingredients if left standing, it is a known practice to continually stir the paint throughout the working day. This is a particular problem in the painting or spraying of motor vehicles in the repair trade. Modern motor vehicles are produced in a wide variety of colours and shades and to achieve a particular required shade, it is often necessary to mix the ingredients from as many as 6 or 8 separate tins of paint as this may apply to every basic colour, a typical large vehicle body repair shop may require to have ready access to perhaps 60 or more separate tins of paint. If apparatus were built to stir all of these containers continually, the apparatus would require a very powerful motor and substantially constructed driving means to ensure reliability during the continuous operation.

The present invention seeks to provide a solution to this problem by providing a liquid stirring apparatus in which a selected group or groups of containers are stirred selectively.

According to the present invention there is provided liquid stirring apparatus including a plurality of shelves, each adapted to support a plurality of containers for the liquid to be stirred, each shelf having associated therewith

a plurality of stirring devices, each of which has a stirring element to stir liquid in an associated container, each shelf having drive means for operating the stirring elements associated therewith, each drive means being selectively engageable with a main drive.

In a preferred embodiment, the plurality of shelves are disposed in a spaced vertical relationship, the main drive comprising a drive shaft with a vertical axis and having coupling means for coupling the shaft to each of the drive means of each shelf, the main drive shaft being connected to an electric or air driven motor. Each drive means may consist of an endless belt or chain engaged by a gear wheel on each of the stirring devices. The means for selectively engaging and disengaging the drive means may comprise a dog clutch, which may be manually operable, or a drive gear adapted to selectively engage the drive between the drive means and the main drive.

In an alternative form, the drive means on each shelf may comprise a wheel on each stirring device in frictional driving engagement with an adjacent one of the devices through an intermediate idler wheel to provide a series drive connection between each stirring device and the main drive shaft. In this embodiment drive to the individual stirring device may be selectively engageable by movement of one or more of the intermediate rollers into and out of frictional engagement with the stirring devices.

An embodiment of the present invention will now be described by way of example with reference to the accompanying informal drawings in which:-

Figure 1 shows schematically, a paint stirring apparatus having 6 shelves with a total of 78 stirring devices,

Figure 2 shows, schematically, details of a stirring device,

Figures 3a, 3b and 3c show views of one form of drive means comprising an endless chain,

Figure 4 shows a gear mechanism for selectively engaging and disengaging the drive to the endless chain and,

Figure 5 shows an alternative drive arrangement utilising a friction drive.

Referring now to Figure 1, there is shown a shelf arrangement having six shelves 1, each adapted to carry a plurality of containers for paint. Depending from each shelf there is a plurality of stirring devices each incorporating a driving head adapted to drive a rotatable stirring element. Details of a driving head are shown in greater detail in Figure 2. The driving heads 2 are connected to a main drive shaft shown in outline reference 3, by drive means associated with each row of driving heads, which will be described hereinafter. The main drive shaft 3 is connected to an electric motor 4, which in this embodiment is of one horse power, and which is located on the bottom shelf.

Referring now to Figure 2 there is shown in greater detail a stirring device and a container for paint. The container 5, is a cylindrical container having a lid 6 incorporating a coin spout 7 normally closed by a closure member 8 biassed to the closed position via a spring 9. The closure member 8 can be opened manually by means of handle 10 which pivots the closure member about a pivot point 11 on the spout 7. This type of container is known. Passing through the lid 6 is a rotatable shaft 12 of a stirring element, reference 13, the stirring element incorporates a stirring panel 14 which consists of a generally helical or curved member secured to the shaft 12 for rotation therewith. The paddle 14 is designed to sweep substantially the entire volume of the container 5 and is designed to rotate only in a clockwise direction for efficient stirring. At its upper end the shaft 12 has a bifurcated end 15, the limbs of which are adapted to engage on each side of a driving connector 16 of the driving head. The connector 16 is secured for rotation to a drive shaft 17 rotatably mounted in a support 18 which

forms part of one of the shelves 1. A driving wheel 19 is secured to the shaft 17, the driving wheel 19 having a rubber tyre 20 on its periphery which is in frictional driving engagement with a drive roller as will be described in greater detail hereinafter with reference to Figure 5.

Referring now to Figures 3b and 3c there is shown, schematically, one form of drive means for the stirring device of one shelf unit which is driven by a chain drive. Figure 3a shows a plan view showing in outline a drive gear 21 for each driving head 2 which are all in engagement with an endless chain 22. The first driving head 23 closest to the main drive shaft 3 carries a second gear 24 which is connected to a gear 25 of an engagement mechanism shown generally at 26 by a further endless chain 27. The mechanism 26 is shown in greater detail in figure 4.

Referring now to Figure 4, the engagement mechanism 26 has an engagement gear 29 freely rotatably mounted on a mounting 30 which is itself mounted on the member 18 so as to be movable linearly through a predetermined range of movement. The mounting thus has two elongate slots 31 through which locating bolts 32 extend to secure the mounting 30 to the member 18. The movement of the mounting 30 and hence the gear 29 is carried out manually, the mounting incorporating a handle 33. When the mounting 30 is in its innermost position, the gear 29 is meshed with both a main drive gear 34 secured to the main drive shaft 3 and also with a drive transmission gear 35 which is coaxial with and secured for rotation with the chain driven gear 25. Thus, when the mounting 30 is pushed into its innermost position drive is transmitted from the drive shaft 34, gear 29 and gear 35 to the chain 27 and hence to the main drive chain 22 driving the individual stirring devices. The position of the mounting 30 in its two limit positions may be maintained by spring loaded detents (not shown). Although not shown, it is envisaged that a further engagement mechanism 26 may be located, for example, half way along the shelf to enable

drive to the right hand part of the shelf as shown in Figure 3 to selectively be engageable. In this case, there would be two endless chains 22 with the additional engagement mechanism located therebetween.

Referring now to Figure 5 there is shown an alternative form of drive utilising a frictional engagement. As shown in Figure 2 each stirring device has a driving wheel 19 with a rubber tyre 20 on its periphery. An idler roller 36 is located between each adjacent stirring device which serves to transmit drive from the main drive shaft 3, serially through each of the driving wheels 19. The main drive shaft 3 is connected to the first stirring device 37 through a drive belt 38. The selective engagement of the drive to the stirring devices in this embodiment may be carried out in a number of ways. For example one or more of the idler rollers may be mounted on a mounting similar to the mounting 30 described with reference to Figure 3 and 4. Alternatively, means may be provided to bring the drive belt 38 into and out of driving engagement with the first stirring device 37, or, a dog clutch may be provided between the main shaft 3 and the drive pulley 39.

In this description the term liquid also refers to fluids, slurries and powders.

Claims:

1. Liquid stirring apparatus including a plurality of shelves, each adapted to support a plurality of containers for the liquid to be stirred, each shelf having associated therewith a plurality of stirring devices, each of which has a stirring element to stir liquid in an associated container, each shelf having drive means for operating the stirring elements associated therewith, each drive means being selectively engageable with a main drive.
2. Liquid stirring apparatus according to claim 1, wherein said shelves are disposed in a spaced vertical relationship.
3. Liquid stirring apparatus according to claim 1 or 2, wherein the main drive comprises a drive shaft with a vertical axis and coupling means for coupling the drive shaft to each of said drive means of each shelf.
4. Liquid stirring apparatus according to claim 3, wherein the drive shaft is connected to an electric or air motor.
5. Liquid stirring apparatus according to claims 1, 2, 3 or 4, wherein each of said drive means includes an endless belt or chain engaged by a gear wheel on each of said stirring devices.
6. Liquid stirring apparatus according to claim 3, 4 or 5 wherein the drive means includes a wheel on each said stirring device in frictional driving engagement with an adjacent one of the devices through an intermediate idler wheel to provide a series drive connection between each stirring device and said main drive shaft.
7. Liquid stirring apparatus according to any one of claims 1 to 6, wherein each of said stirring devices is selectively engageable.
8. Liquid stirring apparatus according to claim 6 and 7,

wherein drive to each of said stirring devices is selectively engageable by movement of one or more of the intermediate wheels into and out of frictional engagement with the stirring devices.

9. Liquid stirring apparatus according to any one of claims 1 to 8, wherein the selective engagement of each drive means with the main drive is manually operable.

10. Liquid stirring apparatus according to any one of claims 1 to 9, wherein the means for selectively engaging each drive means includes a dog clutch.

11. Liquid stirring apparatus according to any one of claims 1 to 10, wherein said means for selectively engaging each drive means includes a drive gear adapted to selectively engage the drive between the drive means and the main drive.

12. Liquid stirring apparatus according to any one of claims 1 to 11, wherein each said stirring device further includes a driving head adapted to stir said stirring element.

13. Liquid stirring apparatus according to any one of claims 1 to 12, wherein said stirring element comprises a rotatable shaft and a stirring panel secured to the shaft for rotation therewith.

14. Liquid stirring apparatus according to claims 12 and 13, wherein the upper end of said rotatable shaft has a bifurcated end, the limbs of which are adapted to engage on each side of a drive connector of said driving head.

15. Liquid stirring apparatus according to claim 14, wherein said drive connector is secured for rotation to a drive shaft rotatably mounted in a support which forms part of one of said shelves.

16. Liquid stirring apparatus as hereinbefore described with reference to and as illustrated in the accompanying drawings.